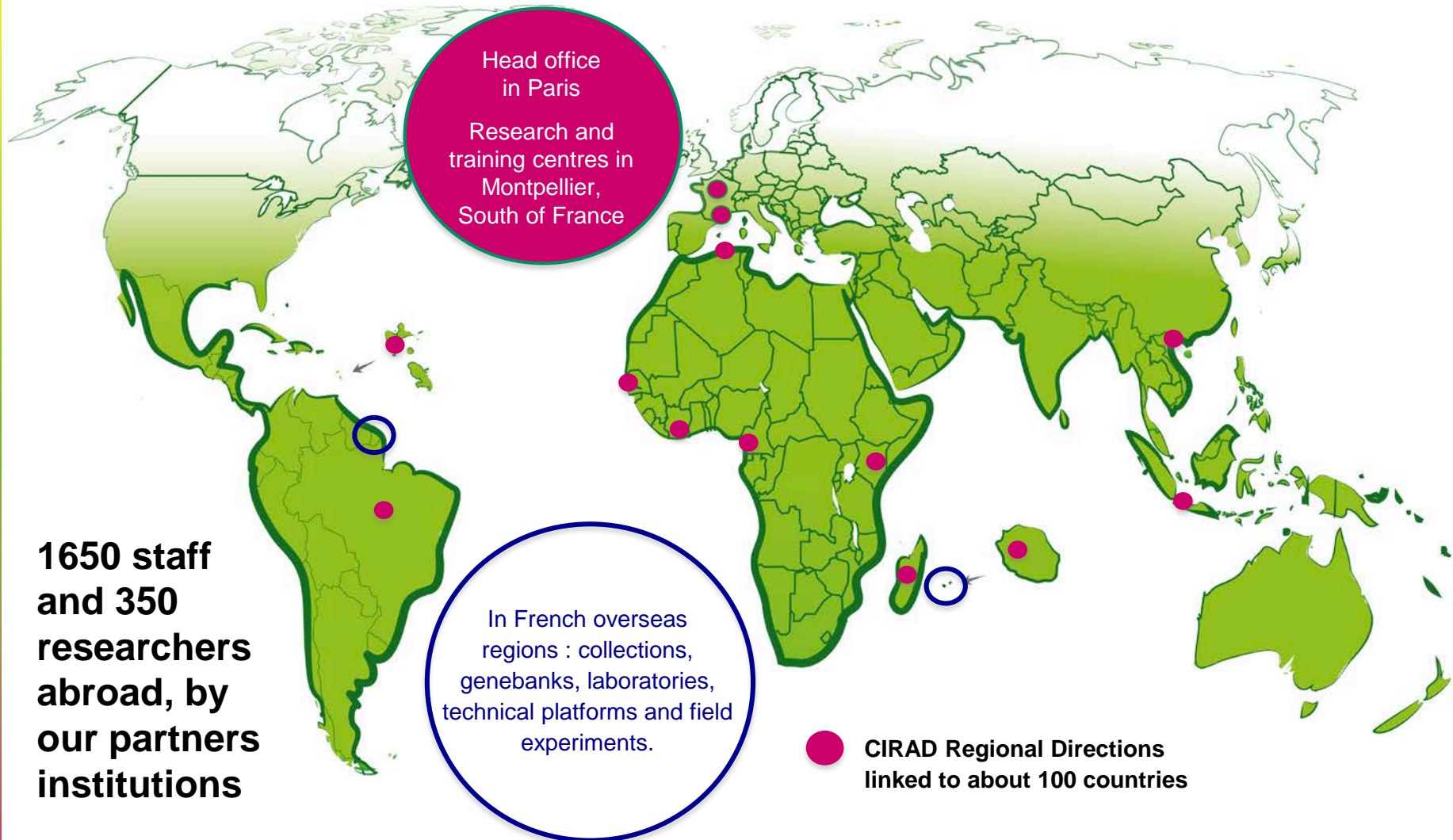


Coconut research at CIRAD

Dr. Alexia Prades
Coconut sector focal point
www.cirad.fr

CIRAD - French Agricultural Research and International Cooperation Organization working for the sustainable development of Tropical and Mediterranean regions



Three scientific departments

UNDERSTANDING
biological systems,
from molecule
to ecosystem



**Biological Systems
Department (BIOS)**

11 research units

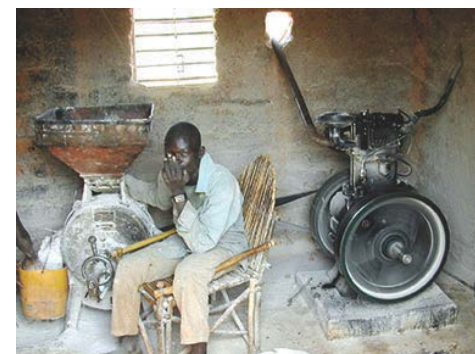
ANALYSING
the practices and
performance of
farming systems,
from plot to farm



**Tropical Production
and Processing Systems
Department (PERSYST)**

12 research units

SUPPORTING
players in rural
areas,
from a local to
a global level



**Environment
and Societies
Department (ES)**

10 research units

A basic working principle: research in partnership

- Working together to establish and implement priorities
- Working in the South, where our partners are, in their laboratories or in their fields



Training the talents of the future

800 researchers and technicians received and trained each year

300 PhD students (60% from developing and emerging countries)

CIRAD and the coconut sector



- **More than 70 years of experience on coconut fruit production and processing in the world**
- **A pool of 15 researchers**
 - Breeding, genomic, bioinformatic (4)
 - Agronomy and GIS (4)
 - Phytopathology and entomology (2)
 - Coconut fruit processing and products quality (4)
 - Market and value chain analysis (1)

Sustainability of coconut sector in the future

1. **Replant** and replace old trees with proper planting material
2. Preserve the **biodiversity** in genebanks (to address new market trends, climate change...)
3. Decrease the **biotic pressure** (LYDs and insects) and increase **productivity** in the field (fertilizers, inter-cropping...)
4. Improve the **quality** of copra (efficient and safe dryers, controlled conditions and duration of storage) – (sanitary issue)
5. Encourage **diversification** of products and participatory certification systems. This will increase farmers' and processors' revenues and create jobs in rural areas.



**CIRAD activities to support this strategy
in partnership**



Signature of MoU between CIRAD and ICC

in Jakarta, Indonesia

duration 5 years from 2019 to 2023

Topics

- **Conservation**, breeding and selection: genomic studies, characterization of the biodiversity
- **Agronomy**: primary production from nursery stages until harvesting
- **Phytopathology** and **Entomology** (focus on LYD)
- **Processing** : domestic to semi-industrial scales, focus on re-engineering of traditional process
- **Quality** and **standards** for coconut products
- Development of **communication** and information (documents, database, etc.)
- **Training** of scientific officers

Signature of MoU between CIRAD and ICC

in Jakarta, Indonesia

duration 5 years from 2019 to 2023

Three forms of cooperation

- Project for **technical assistance**
- Project for **research**
- Other **specific projects** :
 - Training of research and technical staff
 - Hosting of research and technical staff
 - Organization of seminars, meetings...

Seed supply for replanting in the Pacific



Dr. Roland Bourdeix



Dr. Jean-Pierre Labouisse



The CIDP Project Purpose is to improve the competitiveness of small producers engaged in the coconut value chains, through a strengthened regional integration of related markets and the **intensification of Coconut production.**

<http://replantcoconut.blogspot.com/>

Source R. Bourdeix et al., APCC Conf., 2018



Genomic : Coconut Genome Sequencing



Dr. Luc Baudouin



Dr. Stéphanie Sidibe-Bosc

Mapping population in the nursery
(CNRA, CIRAD, COGENT)
2012 – 2016



© Dr Issali, CNRA, May 2015



Leaf samples sent to CIRAD for analyses
Sept.2015 through SMTA



Coconut Genome sequencing

First publication of the sequence of the coconut genome by CATAS, BGI, CIRAD, CNRA

Xiao, Y., Xu P., et al. (2017). "The genome draft of coconut (*Cocos nucifera*)."
GigaScience: gix095-gix095.

The screenshot shows the GigaScience website interface. At the top, there's a navigation bar with 'OXFORD ACADEMIC' on the left, 'cirad-4', 'Sign In', and 'Register' on the right. Below this is the 'GIGAⁿ SCIENCE' logo and the 'BGI' logo with Chinese characters '华大基因'. A green navigation bar contains 'Articles', 'Submit', 'Alerts', and 'About'. A search bar is on the right with 'All GigaScience' and a search icon. The main content area displays the article 'The genome draft of coconut (*Cocos nucifera*)' as an 'ACCEPTED MANUSCRIPT'. It lists authors: Yong Xiao, Pengwei Xu, Haikuo Fan, Luc Baudouin, Wei Xia, Stéphanie Bocs, Junyang Xu, Qiong Li, Anping Guo, Lixia Zhou, and a 'Show more' link. It includes the journal 'GigaScience', the identifier 'gix095', a DOI link, and the publication date '05 October 2017'. Below the title are icons for 'Views', 'PDF', 'Cite', 'Permissions', and 'Share'. The 'Abstract' section is highlighted in light blue, starting with 'Background' and describing the coconut palm's significance and classification. On the right side of the article, there's a 'View Metrics' button and an 'Email alerts' section with options for 'New issue alert', 'In progress issue alert', 'Advance article alerts', and 'Article activity alert'. At the bottom right, there's a 'Related articles in Google Scholar' and 'Citing articles via Google Scholar' section.

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(GIGA)ⁿ SCIENCE

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Article Contents

Abstract

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ACCEPTED MANUSCRIPT

The genome draft of coconut (*Cocos nucifera*)

Yong Xiao, Pengwei Xu, Haikuo Fan, Luc Baudouin, Wei Xia, Stéphanie Bocs, Junyang Xu, Qiong Li, Anping Guo, Lixia Zhou ... Show more

Author Notes

GigaScience, gix095, <https://doi.org/10.1093/gigascience/gix095>

Published: 05 October 2017

Views PDF Cite Permissions Share

Abstract

Background

Coconut palm (*Cocos nucifera*, 2n = 32), a member of genus *Cocos* and family Arecaceae (Palmaceae), is an important tropical fruit and oil crop. Currently, coconut palm is cultivated in 93 countries, including Central and South America, East and West Africa, Southeast Asia and the Pacific island, with a total growth area of more than 12 million hectares (www.fao.org/faostat/en/). Coconut palm is generally classified into two main categories: "Tall" (flowering 8–10 years after planting) and "Dwarf" (flowering 4–6 years after planting), based on morphological characteristics and breeding habits. This *Palmae* species has a long growth period

View Metrics

Email alerts

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Preserving biodiversity

Consultancy for the Government of Ivory Coast to prepare the transfer of the International Coconut Genebank for Africa and Indian Ocean in collaboration with CNRA, COGENT and TIRPAA/FAO



Dr. Thierry Leroy



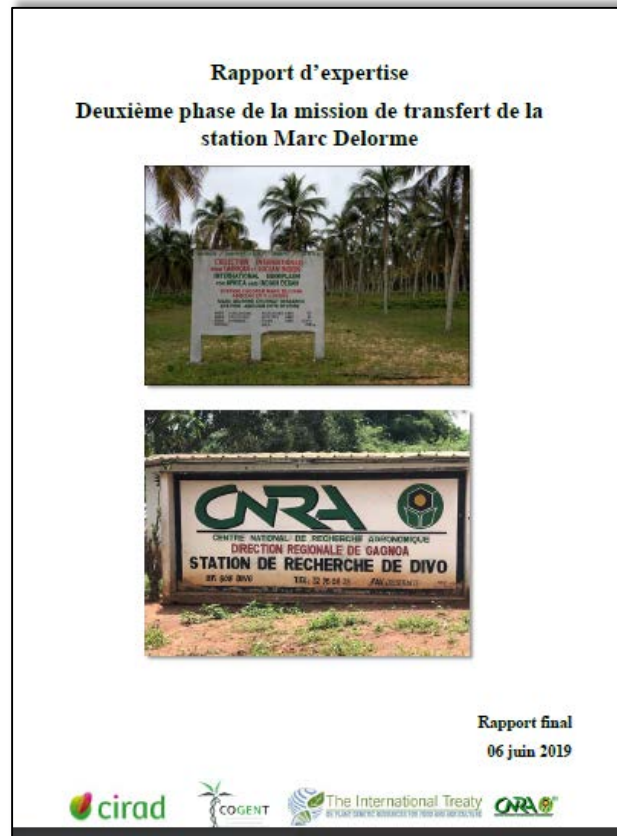
Dr. Luc Baudouin



Dr. Roland Bourdeix



Dr. Fabian Pilet



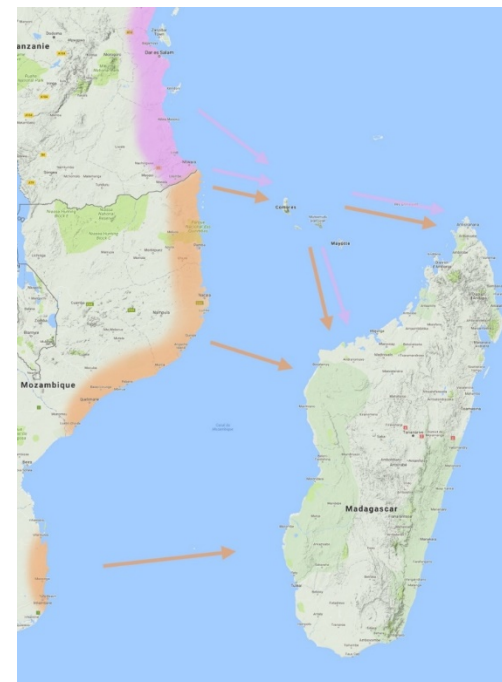
Preserving biodiversity against lethal yellowing in Indian Ocean

EPIBIO PROJECT REGIONAL EPIDEMIO SURVEY AND LETHAL YELLOWING IDENTIFICATION



Dr. Fabian Pilet

- Two types of phytoplasma in East Africa
- Risks of contamination for Madagascar, Comoro Islands, etc.
- Regular prospection missions, sampling and biomolecular analyses



Source F. Pilet, Coconut internal workshop, CIRAD, Sept.2018

Preserving biodiversity against lethal yellowing

EUROPEAN H2020 PROJECT TROPICSAFE



Insect-borne prokaryote-associated diseases in tropical and subtropical perennial crops

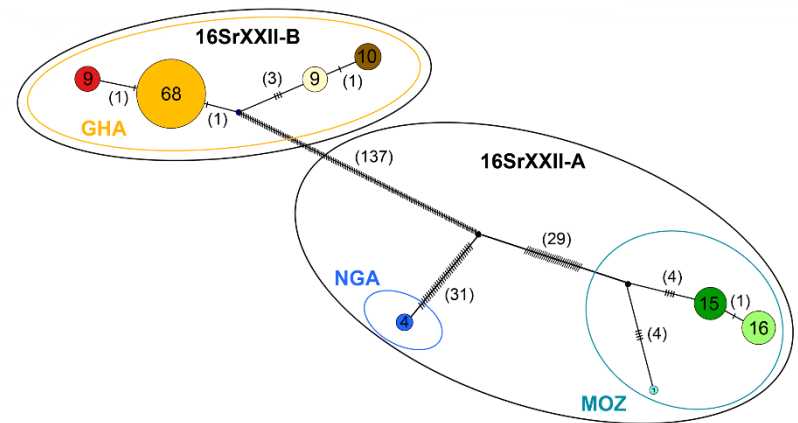
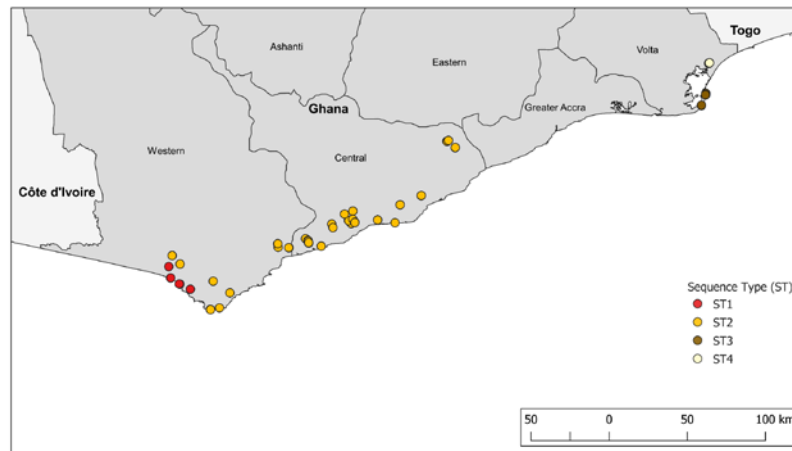
- Coordination : A. Bertaccini (University of Bologna, Italy)
- Three biological models : vines, citrus, and coconut



Dr. Fabian Pilet



Dr. Luc Baudouin



Control of biotic stress

Full success confirmed in Timor Leste



Dr Laurence Ollivier Dr Xavier Bonneau

Introduction of a biological agent (***Chilocorus politus***, Coleoptera, Coccinellidae) to control the pest *Aspidiotus destructor* (Hemiptera, Coccoidea, Diaspididae)



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December 2018



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December 2003

Diversification

Value chain analysis of the coconut sector in Côte d'Ivoire – ongoing



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Yao
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Agro-economical team



Dr. Jean-Jacques Iritié Bi Goli
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Fulgence Soumonni
(Master Student, INP-HB)

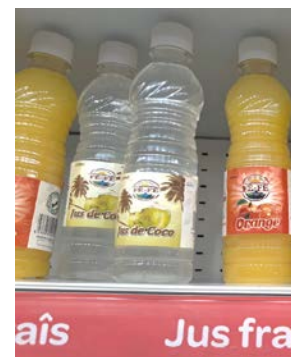
Traditional

Products from Côte d'Ivoire

New



© V.Bancal, Cirad



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Thank you for your attention

